



STATE OF NEW HAMPSHIRE
SEVERE ACUTE RESPIRATORY SYNDROME (SARS)
SURVEILLANCE AND CLINICAL RESPONSE GUIDELINES

Prepared by

New Hampshire Department of Health and Human Services

NH Department of Health and Human Services
OCPH, Bureau of Communicable Disease Control
SARS Surveillance and Clinical Response Guidelines

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Abbreviations used in this document.

BCDC	NH DHHS, Bureau of Communicable Disease Control
BCDS	NH DHHS, Bureau of Communicable Disease Surveillance
CDC	Centers for Disease Control and Prevention
C/PIT	Contact/Patient Investigation Team
DHHS	NH Department of Health and Human Services
HCW	Health care worker
HEICC	Hospital Emergency Incident Command Center
ICP	Infection Control Personnel
MHD	Manchester Health Department
NH	New Hampshire
NH BEM	New Hampshire Bureau of Emergency Management
OCPH	DHHS, Office of Community and Public Health
PAPR	Powered, air-purified respirator
PHL	DHHS, Public Health Laboratories
PPE	Personal protective equipment
SARS	Severe acute respiratory syndrome
WHO	World Health Organization

I. INTRODUCTION: What Is SARS?

SARS, or severe acute respiratory syndrome, is an atypical pneumonia caused by a previously unknown virus, a coronavirus (called SARS Co-V). Scientists remain uncertain whether the virus previously infected only animals or if it is a mutated form of a human virus. It was first identified in Guangdong Province, China in November 2002 and later spread to Hanoi, Singapore, and Hong Kong (http://www.who.int/csr/sarsarchive/2003_03_12/en/). It has since spread to 29 countries, with over 8000 probable cases and nearly 800 deaths worldwide.

The spread of SARS was facilitated by the globally mobile nature of our society, with most initial cases being recognized in travelers from SARS-affected areas. In addition, infections among health care workers (HCWs) have been one of the hallmarks of the global SARS outbreak since its recognition. Data available from outbreak investigations in numerous affected countries indicate that a large proportion of secondary SARS transmission (often >50%) occurred in hospital and health care settings, among HCWs caring for SARS patients, and other patients and visitors. For many of these cases, transmission could be attributed to initially unrecognized SARS cases, where recommended protective measures and equipment had not been in use. In addition, a substantial proportion of secondary cases have also occurred among close household contacts of SARS patients and exposed HCWs who failed to use appropriate infection control procedures while caring for SARS patients. There is also clear evidence of the risk of community transmission when appropriate infection control measures were not instituted.

New Hampshire (NH) has acted aggressively to minimize the risk of SARS exposure and infection to its citizens. As of 10/16/03, there have been no SARS cases in the State. (Three suspect cases were removed from the Centers for Disease Control and Prevention [CDC] list following the updated SARS case definition in July 2003.)

The purpose of this document is to provide health care providers, local health departments, public health officials, health care facilities, policymakers, and other services and agencies that may be called on during a SARS outbreak in NH with clinical guidance and broad recommendations on effective containment strategies. This guidance can be used to develop detailed local implementation plans based on the characteristics of local outbreak and health care and public health resource capacity. **Given that the global SARS epidemic changes daily, the following guidelines should be considered dynamic, and will be revised as more information becomes available.**

These guidelines are intended to:

- Limit SARS transmission within NH communities
- Minimize SARS-associated morbidity and mortality
- Prevent translocation of SARS beyond community borders
- Minimize panic and civil unrest

These guidelines are *not* intended as a SARS epidemic plan in which surge capacity is addressed or agency, provider, and public roles are delineated. The SARS Epidemic Plan is a forthcoming document, which is intended for release in November 2003 on the DHHS website.

II. DEFINITIONS FOR SARS

A. SARS Case Definition

The CDC is the federal agency responsible for determining the SARS case definition and case classification. The case definition may continue to change with new scientific and clinical developments and is updated at <http://www.cdc.gov/ncidod/sars/casedefinition.htm>

1. Clinical Criteria

- Asymptomatic or mild respiratory illness
- Moderate respiratory illness
 - Temperature of >100.4° F (>38° C) *and*
 - One or more clinical findings of respiratory illness (i.e., cough, shortness of breath, difficulty breathing, or hypoxia)
- Severe respiratory illness
 - Temperature of >100.4° F (>38° C) *and*
 - One or more clinical findings of respiratory illness (i.e., cough, shortness of breath, difficulty breathing, or hypoxia) *and*
 - Radiographic evidence of pneumonia, *or*
 - Respiratory distress syndrome, *or*
 - Autopsy findings consistent with pneumonia or respiratory distress syndrome without an identifiable cause

2. Epidemiologic Criteria

- Travel (including transit in an airport) within 10 days of onset of symptoms to an area with current or previously documented or suspected community transmission of SARS (see Table below).

Table. Travel criteria for suspect or probable U.S. cases of SARS		
Area	First date of illness onset for inclusion as reported case	Last date of illness onset for inclusion as reported case†
China (Mainland)	November 1, 2002	July 13, 2003
Hong Kong	February 1, 2003	July 11, 2003
Hanoi, Vietnam	February 1, 2003	May 25, 2003
Singapore	February 1, 2003	June 14, 2003
Toronto, Canada	April 1, 2003	July 18, 2003
Taiwan	May 1, 2003	July 25, 2003
Beijing, China	November 1, 2002	July 21, 2003

†The last date for illness onset is 10 days (i.e., one incubation period) after removal of a CDC travel alert. The case patient's travel should have occurred on or before the last date the travel alert was in place.

- Close contact within 10 days of symptoms with a person known or suspected to have SARS. A close contact is defined as a person who has cared for or lived with a person known to have SARS or having a high likelihood of direct contact with respiratory secretions and/or body fluids of a patient known to have SARS. Examples of close contact include kissing or embracing, sharing eating or drinking utensils, close conversation (<3 feet), physical examination, and any

other direct physical contact between persons. Close contact does not include activities such as walking by a person or sitting across a waiting room or office for a brief period of time. A contact is defined as a person who has been exposed to someone with suspect or probable SARS, but does not meet the definition of a close contact.

3. Laboratory Criteria

- Confirmed:
 - Detection of antibody to SARS-CoV in a serum specimen, *or*
 - Detection of SARS-CoV RNA by reverse transcription-polymerase chain reaction (RT-PCR) confirmed by a second PCR assay, using a second aliquot of the specimen and a different set of PCR primers, *or*
 - Isolation of SARS-CoV in tissue culture.
- Negative: Absence of antibody to SARS-CoV in convalescent serum (obtained >28 days after symptom onset).
- Undetermined: Laboratory testing not performed or incomplete.

B. CDC Case Classification

1. Probable SARS Case

- Meets the clinical criteria for severe respiratory illness of unknown etiology, *and*
- Meets epidemiologic criteria for exposure, *and*
- Laboratory criteria confirmed, or undetermined.

2. Suspect Case

- Meets the clinical criteria for moderate respiratory illness of unknown etiology, *and*
- Meets the epidemiologic criteria for exposure, *and*
- Laboratory criteria confirmed, or undetermined.

C. CDC Exclusion Criteria

A case may be excluded as a suspect or probable SARS case if:

- An alternative diagnosis can fully explain the illness, *or*
- The case has a negative convalescent-phase serum sample (>28 days after symptom onset) or was reported on the basis of contact with an index case that was subsequently excluded as a case of SARS (i.e., another etiology explains the illness) provided that other possible epidemiologic exposure criteria are not present.

III. FOCUS ON PREVENTING SARS TRANSMISSION

SARS is spread principally by airborne droplets. Infected individuals may cough or sneeze droplets into the air, which are then breathed in by another individual. It is possible that SARS can also be transmitted more broadly through the air, contaminated objects, or other body secretions.

The primary tools that have been shown effective in preventing SARS transmission are case detection (through enhanced awareness and epidemiologic and laboratory surveillance), isolation, active monitoring of contacts, and quarantine measures. Such tools are especially important, since to date no specific therapeutic medications or interventions have been identified as effective treatment for SARS. In addition, there is currently no vaccine that can protect persons from infection with the SARS coronavirus.

A. Preventing SARS Transmission Through Knowledge

The goal of all SARS public information activities is to provide NH's citizens with helpful, timely, and accurate information. The intent of this public information is to encourage caution rather than alarm. The NH State information campaign has been delivered through the broadcast and print media, SARS fact sheets (in English, Spanish, Chinese, Vietnamese, Bosnian, and French), and health care provider educational activities.

1. Printed Materials

Fact sheets are available for citizens and the media by calling the NH Department of Health and Human Services (DHHS) or through the DHHS SARS website (<http://www.dhhs.state.nh.us>). Additional fact sheets and other printed materials will be developed and existing fact sheets will be amended as new information warrants.

2. SARS Website

The NH DHHS website, <http://www.dhhs.state.nh.us>, serves as an informative source for current, accurate SARS information. The site includes general background and updated information for clinicians. Links to other SARS websites are included.

3. Informational Phone Line

The DHHS Bureau of Communicable Disease Control (BCDC) is responsible for managing SARS public inquiries. Through the regular phone lines 603-271-4496 or 1-800-852-3345, the BCDC provides information to callers on a variety of topics. Trained staff is available to assist callers during business hours or for emergencies after hours or during weekends. Hotline numbers can be set up quickly if the need arises.

4. Media Activities

The NH media have demonstrated a strong interest in SARS. DHHS and partner agencies have worked cooperatively with media outlets statewide to communicate timely, accurate information. DHHS will continue to serve as the lead agency in communicating information about SARS information to the media, with other agencies participating as needed.

B. Preventing SARS Transmission at the Individual Level

Individuals can take several preventive measures to reduce the risk of SARS to themselves, their families, and their communities. These measures include:

- Wash hands frequently with soap and warm water or with an alcohol-based hand wash
- Cover your mouth when you cough or sneeze, then wash your hands

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- Consider postponing all unnecessary travel to regions actively affected by SARS (as of October 2003, none known)
- Avoid sharing drinking bottles, eating utensils, toothbrushes, etc.
- Decrease contact with people suffering from respiratory illness
- Contact a health care provider if you are experiencing any SARS-related symptoms, including high fever, dry cough, or shortness of breath. In many circumstances, **initial contact to a health care provider is best made by telephone**, to reduce the risk of transmitting SARS to other people while waiting in a crowded emergency room or clinic office
- If presenting to a health care facility
 - **Immediately** inform staff that you may have SARS-related symptoms to reduce the risk of transmitting SARS to other people
 - Put a mask on yourself and any people accompanying you who have had exposure to your illness. These masks should be available in the waiting area, or can be requested.

C. Preventing SARS Transmission at the Clinical Level

Once a suspect or probable case has been identified, regardless of severity of illness, the patient must be immediately reported to the NH BCDC. For reporting during business hours, please call 603-271-4496. After hours and on weekends, please call 603-271-5300 or 1-800-852-3345 ext. 5300 and request to talk with the public health nurse on call.

The following appendices contain protocols that are relevant to clinicians and health care facilities:

- Appendix 1: Clinical Diagnosis and Treatment of SARS
- Appendix 2: SARS Laboratory Testing
- Appendix 3: SARS Preparedness and Case Investigation at Non-Ambulatory Health Care Facilities
- Appendix 4: SARS Preparedness and Case Investigation at Ambulatory Health Care Facilities
- Appendix 5: Isolation and Quarantine Procedures for SARS

D. Preventing SARS Transmission at the Law Enforcement Level

NH DHHS recommends that every law enforcement officer should carefully follow recommendations for hand hygiene (e.g., frequent hand washing or use of alcohol-based hand rubs, if hands are not visibly soiled), particularly after contact with body fluids (e.g., respiratory secretions, urine, or feces). Officers should also use disposable gloves for any direct contact with body fluids of a SARS patient. ***However, gloves are not intended to replace proper hand hygiene.*** Immediately after activities involving contact with body fluids, gloves should be removed and discarded, and hands should be cleaned. Gloves must never be washed or reused. In addition, the use of an N-95 respirator when interacting with a SARS suspect or patient is recommended.

Additional information is available on a CD by contacting Mr. Keith Lohmann at the NH Police Standards and Training Council by email at sarsrequest@pssc.state.nh.us. In addition, the CDC has developed a joint training tool for law enforcement and public health officials on investigative responses to bioterrorism that contains relevant information for SARS prevention. It is accessible at <http://www.phppo.cdc.gov/od/phlp>.

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E. Preventing SARS Transmission During and Following International Air Travel

Appendix 6, Management of Airline Passengers with Suspect Disease, was prepared for a variety of transmissible diseases, but contains principles and information relevant to SARS. Specific guidelines for SARS are in preparation. In addition, the CDC provides guidelines for flight crews on planes with potential SARS patients (http://www.cdc.gov/ncidod/sars/pdf/flight_crew_guidelines.pdf) and for cleaning a plane after a potential SARS patient is removed (<http://www.cdc.gov/ncidod/sars/pdf/aircraftcleanup-sars.pdf>).

F. Preventing SARS Transmission When Transporting Patients

- Suspected SARS patients should be transported using the minimum number of EMS personnel and without non-SARS patients or passengers in the vehicle.
- Receiving facilities must be notified prior to arrival of suspected SARS patients to facilitate preparation of appropriate infection control procedures and facilities.
- Concerns regarding movement of possible SARS patients in the United States should be discussed with appropriate local, state and federal health authorities, including the CDC which has a 24-hour response number: 770 488-7100.

IV. PROCEDURES FOR PUBLIC HEALTH INVESTIGATION OF SARS CASES

A. SARS Case Investigation

The purposes of the case investigation include:

- To determine whether the individual meets the SARS case definition
- To determine the case classification
- To impose isolation of confirmed, probable, and suspect cases
- To identify contacts for tracing, surveillance, and possible quarantine
- To identify the most likely source of initial exposure for the case
- To monitor the clinical course and outcome of cases, including acute and convalescent serum testing, and
- To monitor the epidemiology of the outbreak for surveillance, public education, and media communication

B. Case Report

All cases and suspect cases (see definitions above) must be reported immediately to the NH DHHS Bureau of Communicable Disease Control at 603-271-4496. BCDC staff will screen reports to determine if the clinical presentation meets the SARS case definition. If so, the hospital or physician will be required to submit the appropriate diagnostic specimens. The NH DHHS Public Health Laboratories will be responsible for testing and/or specimen transport to the CDC.

C. SARS Contact Investigation

Contact tracing is essential to preventing further spread of the SARS virus. Suspect and probable cases should be interviewed with regard to their daily activities prior and subsequent to the appearance of clinical symptoms. Contacts will be notified and will be required to monitor their temperature and the appearance of any new respiratory symptoms for a period of ten days from date of exposure. If clinical symptoms develop, contacts will be required to notify their health care provider.

V. SURVEILLANCE FOR SARS

Surveillance is the routine collection, analysis, and dissemination of all data that may be relevant for the prevention and control of a public health problem. Working in cooperation with the CDC, health departments nationwide are conducting activities aimed at detecting SARS. These activities are intended to rapidly detect viral transmission into new geographic locations in order to reduce the risk of transmission. DHHS is the lead agency responsible for conducting human case surveillance for SARS in NH. Ongoing surveillance can identify the risk factors such as travel or contact history of infected individuals, so that the DHHS can make well-informed prevention and response decisions.

The Bureau of Communicable Disease Surveillance (BCDS) monitors infectious disease trends using four data sources. These mechanisms may be useful for early identification of SARS-related respiratory illness in NH.

- **Syndromic Surveillance** – Sixteen sentinel emergency departments (ED) send daily reports to BCDC on four syndromes including respiratory, gastrointestinal, rash, or fever $\geq 100.0^{\circ}\text{F}$ in the absence of other symptoms. These data reflect 60% of total ED visits statewide. The BCDC summarizes and evaluates these data for significant trends.
- **Over-the-Counter Pharmaceutical Surveillance** – Two large supermarket chains located in 23 cities throughout NH report daily sales of over-the-counter medications commonly used for respiratory and gastrointestinal illnesses. Phase One of this surveillance system was recently completed and is being evaluated for future modifications.
- **Medical Examiner Surveillance** – The Medical Examiner notifies DHHS of deaths based on an eight-item symptom criteria list. This system was implemented in March 2003 to identify deaths related to potential bioterrorism events. DHHS may request that an autopsy be performed if the cause of death is due to a reportable or undetermined infectious disease, or if an outbreak investigation is in progress.
- **Death Certificate Reports** – DHHS receives daily, automated data from the NH Bureau of Vital Records about deaths due to natural causes. Data include 50 query diagnoses selected by the DHHS that are infectious diseases. DHHS may request that an autopsy be performed if the cause of death is a reportable or undetermined infectious disease, or if an outbreak investigation is in progress.

VI. RESPONSE TO EPIDEMIC SARS

A preliminary operational response plan for epidemic SARS in NH was developed and disseminated in April 2003, and is included as Appendix 7. Following evaluation of the data obtained from public health surveillance activities, DHHS will recommend that prevention and control measures be implemented in proportion to the risk of community or hospital spread of SARS infection. Each risk level is described in Appendix 7, along with specific recommended responses. Prevention and control measure recommendations will be determined on a case-by-case basis, in cooperation with other agencies and

partners as needed, such as Department of Safety, Bureau of Emergency Management, and the Governor's Office. Of particular note, in the event of a SARS outbreak in progress, the Governor may declare a Public Health Emergency pursuant to RSA 107 C: 5.

However, **the epidemic SARS response plan is in evolution**, depending on new information and guidelines. In particular, the CDC intends to release revised guidance to states by November 2003. In close collaboration with partners, the NH DHHS will re-evaluate the response plan and provide a more comprehensive plan by December 2003.

VII. REFERENCES

Information for SARS Patients and Their Close Contacts. This fact sheet answers patient questions about the SARS epidemic of 2003 and describes the disease, its symptoms, and precautions to take in the home environment when caring for someone with SARS:

<http://www.cdc.gov/ncidod/sars/factsheetcc.htm>.

Basic Information About SARS. In addition to providing some of the same information as the preceding fact sheet, this page provides an overview of CDC activities to control SARS and provides guidance for persons traveling to areas with SARS: <http://www.cdc.gov/ncidod/sars/factsheet.htm>. In addition, the World Health Organization (WHO) (<http://www.who.int/csr/sars/en/index.html>) also provides basic information about the Global SARS situation. The extensive Canadian experience is published on the Health Canada website (<http://www.hc-sc.gc.ca/english/protection/warnings/sars/index.html>).

Isolation and Quarantine. This page explains the processes of patient isolation and quarantine, the differences between the two, and how these procedures apply to the SARS outbreak of 2003 and any future such outbreaks: <http://www.cdc.gov/ncidod/sars/isolationquarantine.htm>.

The following additional web pages offer information on various aspects of infection control related to SARS. The information is based on CDC's experience in the 2003 SARS outbreak:

Interim Laboratory Biosafety Guidelines for Handling and Processing Specimens Associated with Severe Acute Respiratory Syndrome (SARS): <http://www.cdc.gov/ncidod/sars/sarslabguide.htm>.

Interim Domestic Guidance for Health Departments in the Management of School Students Exposed to Severe Acute Respiratory Syndrome (SARS):
<http://www.cdc.gov/ncidod/sars/exposurestudents.htm>.

Interim Guidance on Infection Control Precautions for Patients with Suspected Severe Acute Respiratory Syndrome (SARS) and Close Contacts in Households:
<http://www.cdc.gov/ncidod/sars/ic-closecontacts.htm>.

Safe Handling of Human Remains of Severe Acute Respiratory Syndrome (SARS) Patients:
Interim Domestic Guidance: <http://www.cdc.gov/ncidod/sars/autopsy.htm>.

Interim Domestic Guidance on Persons Who May Have Been Exposed to Patients with Suspected Severe Acute Respiratory Syndrome (SARS):
<http://www.cdc.gov/ncidod/sars/exposuremanagement.htm>.

Interim Domestic Guidance for Health Departments in the Management of School Students Exposed to Severe Acute Respiratory Syndrome (SARS):
<http://www.cdc.gov/ncidod/sars/exposurestudents.htm>.

Interim Guidelines for Laboratory Diagnosis of SARS-CoV Infection:
<http://www.cdc.gov/ncidod/sars/labdiagnosis.htm>.

Other relevant websites:

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5212a5.htm>

<http://www.who.int/csr/sars/casedefinition/en/>

<http://www.cdc.gov/ncidod/sars/testresultsc.htm>

<http://www.cdc.gov/ncidod/sars/isolationquarantine.htm>

<http://www.cdc.gov/ncidod/sars/factsheetlegal.htm>

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5223a5.htm>

APPENDIX 1. Clinical Diagnosis and Treatment of SARS

The following information is intended for health care providers.

A. Clinical Features of SARS

The incubation period for SARS is typically 2-7 days; however, isolated reports have suggested an incubation period as long as 10 days. Typically, the illness begins with a prodrome of fever ($>100.4^{\circ}\text{F}$ [$>38.0^{\circ}\text{C}$]). Fever is often high and may be associated with chills and rigors. Additional symptoms may include headache, malaise, and myalgia. Some individuals may initially have mild respiratory symptoms, but pharyngitis and rhinorrhea were reported in only 13% and 2% of patients from the Canadian cases (personal communication, John Carsley, MD, Montreal Public Health Department). Typically, rash and neurological or gastrointestinal findings are absent; however, some patients have reported diarrhea during the febrile prodrome.

After 3-7 days of symptoms, a lower respiratory phase begins with the onset of a **dry, nonproductive** cough or dyspnea, which may be accompanied by or progress to hypoxemia. In 10%-20% of cases, the respiratory illness is severe enough to require intubation and mechanical ventilation. Only 5% of patients reported **productive** cough in the Canadian series (personal communication, John Carsley, MD, Montreal Public Health Department). Chest radiographs may be normal during the febrile prodrome and throughout the course of illness. However, in a substantial proportion of patients, the respiratory phase is characterized by early focal interstitial infiltrates progressing to more generalized, patchy, interstitial infiltrates. Some chest radiographs from patients in the late stages of SARS have also shown areas of consolidation.

The severity of illness is highly variable, ranging from mild illness to death. Although a few close contacts of patients with SARS developed a similar illness, the majority remained well. Some close contacts reported a mild, febrile illness without respiratory signs or symptoms, suggesting the illness might not always progress to the respiratory phase. The case-fatality rate among persons with illness meeting the current WHO case definition of SARS is approximately 3%.

B. Diagnosis of SARS

Initial diagnostic testing for suspected SARS patients should include chest radiograph, pulse oximetry, blood cultures, sputum Gram's stain and culture, and testing for viral respiratory pathogens, notably influenza A and B and respiratory syncytial virus (RSV). In addition:

- A specimen for Legionella and pneumococcal urinary antigen testing should also be considered.
- Clinicians should store at proper temperature any available clinical specimens (respiratory, stool, blood, and serum) for additional testing until a specific diagnosis is made.
- Acute and convalescent (>28 days after onset of symptoms) serum samples should be collected from each patient who meets the SARS case definition (see also Appendix 2).
- Paired sera and other clinical specimens can be forwarded through the State health department for testing at the PHL or CDC. Instructions for specimen collection can be accessed at <http://www.cdc.gov/ncidod/sars/lab.htm>.

C. Prevention of SARS Transmission

Clinicians evaluating suspected cases should use standard precautions (e.g., hand hygiene) together with airborne (e.g., N-95 respirator) and contact (e.g., gowns and gloves) precautions (see Appendix 3). Until the mode of transmission has been defined more precisely, eye protection should also be worn for all patient contact. Consideration may be given to the use of a powered air-purifying respirator (PAPR) equipped with high-efficiency particulate air (HEPA) filtration during high-risk situations, such as difficult intubations, *although any additional benefit of its use must be weighed against the increased potential for self-contamination during removal, disposal, and decontamination of the contaminated equipment.*

Adherence to these infection control guidelines and the use of scrupulous technique will prevent transmission of SARS to health care workers. In addition, the following principles should be considered during clinical management:

- **Any patient with fever and cough should receive a surgical mask to prevent transmission to HCWs, staff and other patients.** This will help prevent SARS transmission, but also transmission of influenza, tuberculosis and other infectious diseases.
- **Most isolation, quarantine, and clinical management for SARS can be managed at the patient's home.** SARS patients receiving care at home must wear a surgical mask and avoid contact with other people (see also Appendix 5).
- **Patients should not be hospitalized solely for the purpose of infection control** unless they cannot be discharged directly to their home (e.g., travelers, homeless persons) or if the infection precautions recommended for the home are not feasible (e.g., crowded dormitory setting, prisons, jails, detention centers, homeless shelters, or other multi-person single room dwellings). Under such circumstances, patients may be hospitalized using recommended infection control precautions, or may be discharged to a designated residential facility for isolation of convalescing cases where recommended infection control measures can be followed. The NH DHHS will establish such a facility if the need arises, and this will serve as a statewide resource.
- **Patients seen in ambulatory settings should not be routinely referred to a hospital** for evaluation of SARS, to avoid incurring transmission to hospital patients and staff, or contaminating the facility. Patients who are more severely ill may require hospitalization.

D. Treatment

At present, the most efficacious treatment regimen for SARS is unknown. However, supportive care such as oxygen or mechanical ventilation can improve outcomes in confirmed cases. During investigation for SARS, empiric therapy should include coverage for organisms associated with community-acquired pneumonia of unclear etiology, including agents with activity against both typical and atypical respiratory pathogens. Treatment choices may be influenced by severity of the illness and prevailing community pathogens. Therapy also has included antiviral agents such as oseltamivir or ribavirin. Steroids have been administered orally or intravenously to patients in combination with ribavirin and other antimicrobials, but efficacy is unconfirmed.

If SARS is identified or strongly suspected, infectious disease consultation is recommended. **Avoid transfer of the patient for the sole purpose of consultation** to help reduce opportunities for health care facility transmission of SARS. If a facility does not have an infectious disease consultant on-site, in most cases, consultation can be done by phone.

NH DHHS will work in conjunction with health care providers and health care facilities to manage SARS cases.

APPENDIX 2. SARS Laboratory Testing

The NH DHHS and local health departments will work with hospitals and physicians to facilitate laboratory testing for SARS suspect cases. Patients who do not meet the definition for a SARS suspect case (such as those with milder illness) will also be tested, even if they are not admitted to a hospital. However, these will be lower priority and tests will be performed as resources permit. Rapid tests for influenza and, when suspected, respiratory syncytial virus (RSV) should be done before the SARS testing. The expected time frame for receiving confirmatory laboratory reports sent to the CDC is 2-3 weeks.

Tests for SARS-CoV continue to be refined, and the sensitivity and specificity remain uncertain. It is unclear which tests perform best at which stage of illness. Several types of newly developed tests are being used to test for SARS-CoV:

- Serum antibody tests, including both enzyme immunoassay (EIA) and indirect fluorescent-antibody (IFA) formats, have been developed. At this time, CDC is interpreting positive test results to indicate previous infection with SARS-CoV. However, some people do not test positive until more than 28 days after onset of illness. Therefore, a negative test result can be considered a true negative only if the specimen was collected more than 28 days after the patient's onset of illness. For patients with a negative antibody test result whose specimens were obtained 28 or fewer days after illness onset, an additional antibody test should be done on a specimen drawn more than 28 days after illness onset.
- Reverse transcriptase polymerase chain reaction (RT-PCR) testing is also available. This test can detect SARS-CoV RNA in clinical specimens, including serum, stool, and nasal secretions.

The NH DHHS Public Health Laboratories are conducting both the EIA and the RT-PCR testing. The BCDC is responsible for completing all paperwork related to patient authorization for specimen collection.

A positive test result suggests that the patient with SARS has or recently has had an infection with SARS-CoV. However, it is possible that a positive test result could be incorrect (i.e., a false-positive). As the tests are improved, CDC may re-test specimens from SARS patients with positive results, and results from these improved tests may be negative.

Some patients with clinical and epidemiologic criteria that meet the SARS case definition may have negative SARS-CoV test results. This may indicate:

- The patient did not have an infection with SARS-CoV. The patient may have a SARS-like illness caused by other viruses or infectious agents. It is often difficult to determine which infectious agent causes a person to become ill with fever, respiratory symptoms, and pneumonia.
- The test results may be incorrect (i.e., false-negative). As the tests are improved, CDC may re-test specimens from SARS patients with negative test results. Results from more sensitive, improved tests may be positive.
- The samples were not obtained at a point in time during the SARS-CoV infection when test results are positive. The RT-PCR result will be positive only if there is viral RNA in the specimen. This may be for a fairly brief period, depending on which specimen (i.e., serum, stool, nasal secretions) was tested.

APPENDIX 3. SARS Preparedness and Case Investigation at Non-Ambulatory Health Care Facilities

The following guidelines are intended for use at non-ambulatory health care settings, such as hospitals and long-term care facilities.

A. The SARS Team

For development of a facility SARS plan, each health care facility should assign responsibility to the multi-disciplinary Hospital Emergency Incident Command Center (HEICC) team. Members of this team should also serve as a coordinating point in the event SARS patients are cared for by the facility. The team should represent all departments and areas that might be affected by having a SARS patient cared for as an in- or out-patient. Authority for developing, implementing, and enforcing plan components must be assigned to the Preparedness and Response Team. Suggested members include but are not limited to:

- A “SARS Coordinator” for the hospital to serve as the point of contact for public health, other health care facilities, law enforcement, and other partners who may be involved in responding to SARS. The person assigned this responsibility should be recognized in the facility as having good leadership, organizational, and communication skills. An understanding of health care delivery in the facility and infection control is desirable.
- Administration/senior management (including fiscal officer)
- Infection Control/Hospital Epidemiology
- Occupational or Employee Health
- Engineering/Physical Plant
- Nursing Administration
- Medical Staff
- Emergency Department
- Laboratory Administration
- Respiratory Therapy
- Environmental Services (housekeeping, laundry)
- Public Relations
- Facility Safety
- Materials Management
- Education/Training/Staff Development
- Others as needed (e.g., labor representative, human resources, local health department)

B. SARS Plan Components

The HEICC team should consider the following components and NH DHHS recommendations:

1. Surveillance and Early Detection of SARS

- A designated person should be responsible for regularly reviewing available public health information regarding SARS activity in the country and geographic region.

- Determine if surveillance to enhance early detection of cases is needed, for example:
 - Syndromic Surveillance – Using existing data sources, some facilities or health care systems may choose to monitor illness among HCWs or patients. These data may indicate a problem with clusters of respiratory illness that warrant further investigation.
 - HCW Pneumonia Cluster Surveillance – Since SARS among HCWs may be an early indicator of SARS transmission in a community or in a health care facility, evaluating clusters of pneumonias among HCWs may help to identify early cases of SARS, even in areas where SARS transmission has not been previously recognized.

2. Infection Control for Persons with Fever and Cough

In addition to SARS-specific infection control measures, facilities should consider instituting a campaign to have any patients with fever and cough of unknown etiology wear a mask while in settings where they encounter others such as emergency department and clinic waiting rooms. The DHHS is developing a poster that will promote this message and be appropriate to attach a box of masks for immediate dispensing. This will help prevent transmission of other serious, contagious diseases such as influenza and tuberculosis.

3. Triage of SARS Suspects

NH DHHS recommends that **all health care facilities** post a sign in a highly visible area informing patients who have fever and cough, and who may need to be screened for SARS to report immediately to the appropriate facility-designated triage staff. Some patients may not see or respond to the sign prompt, and a second-line plan to identify SARS suspects should be in place. For example, an ambulatory care center receptionist should question patients. Personnel in this role who are not medically trained should have a card prompt available.

The sign prompt and triage staff should ask the following screening questions:

- Have you had respiratory symptoms in the last 48 hours or a documented fever >100.4° F (38° C)?
- Have you traveled in the ten days before onset of current symptoms to an area with known SARS transmission?
- Have you been in close contact with someone who has traveled to an area with known SARS transmission and who is currently suffering a respiratory illness?

4. Management of SARS Suspects and Cases

If screening discloses that a patient is a suspect case of SARS, a surgical (not N-95) mask should be placed on the patient, and **contact, droplet, and airborne precautions** should be implemented immediately. Hand washing, gown, and glove procedures are those routinely prescribed for contact, airborne, and droplet precautions (http://www.cdc.gov/ncidod/hip/isolat/isotab_1.htm). The SARS suspect should be moved to an assessment area (if not already) to separate potential SARS patients from staff and other patients seeking care at the health care facility. This is preferably an area away from other patient areas, with negative pressure in relation to surrounding areas. In some settings during the influenza season (e.g., November–March), consideration might be given to establishing a separate and temporary “cough clinic,” with HEPA filtration, because the volume of patients with fever and cough requiring evaluation may be high. This cough clinic may utilize appropriate existing structures, or may be a temporary structure, such as a mobile trailer adjacent to the health care facility, with ventilation, restroom facilities, water supply, etc. The DHHS is in the process of purchasing portable isolation units which will be deployed to hospitals to increase statewide isolation capacity and may be used to equip a cough clinic.

Triage staff and HCWs caring for SARS suspects or cases should wear an N95 respirator. If SARS is ruled out, then the respirator may be reused. The respirators can be re-used repeatedly by the same HCW if they are properly handled, stored, and not contaminated. Respirators should be stored in a clean, dry location, and discarded if crushed, wet, or contaminated by patient secretions. If SARS has not been ruled out, then do not reuse the respirator after removal. If an N95 respirator is not immediately available and patient contact is unavoidable, a surgical mask should be worn because it may provide some protection.

Triage staff and HCWs caring for SARS suspects or cases should also wear eye protection such as goggles or full face shields (prescription glasses are inadequate) when:

- The patient is not wearing a mask
- During any cough-producing and aerosol-generating procedures
- When there is the potential for splattering or spraying blood or other body substances.

Goggles and face shields may be reused, if cleaned in a manner that will not contaminate the HCW. They should be cleaned between uses according to the manufacturer's recommendations using low-level disinfection at a minimum.

According to the Canadian experience (www.hc-sc.gc.ca/english/protection/warnings/sars/index.html), there is no evidence to support the routine need for enhanced respiratory personal protective equipment such as the powered air-purified respirator (PAPR) system. However, during certain high-risk procedures such as a difficult endotracheal intubation, the PAPR system should be considered in balance to the potential that the increased complexity involved in the removal, disposal, and decontamination of this equipment may increase the risk of HCW self-contamination.

Triage staff should immediately inform the infection control department that a patient is under investigation for SARS, and consultation with an infectious diseases specialist is recommended. Any person accompanying the SARS suspect should be given a surgical mask, but when the decision is made that the patient will be hospitalized, the visitor (and subsequent visitors) should be given an N95 respirator and instructed regarding fit, or not allowed to accompany the patient.

Routine practices should be applied during postmortem procedures.

In addition, the HEICC team should:

- Review admission procedures and determine how they can be streamlined to limit the number of patient encounters in the event the SARS suspect requires hospitalization.
- Identify appropriate paths for movement of SARS patients within a facility and how they will be controlled to limit contact. This movement must be minimized to absolutely essential procedures. Personnel in the area to which the patient is to be transported should be essential only, have received prior notification, and be made aware of appropriate precautions.
- Determine how to "cohort" suspect SARS patients. In this context, cohorting refers to having more than one patient per isolation room. This practice may transmit SARS from infected suspect patients to uninfected suspect patients, and therefore must be considered a "last resort" to be used only when a facility's individual isolation capacity has been exhausted by a large number of suspect patients.
- Establish guidelines for transferring and receiving transfers of SARS or suspect SARS patients. Currently, the NH DHHS is recommending that:
 - **Patients with SARS not be transferred to other health care facilities unless absolutely medically necessary.**

- **It is not recommended that patients with SARS be transferred solely for the purpose of accommodation in a negative pressure room.**
- **If it is deemed necessary to transfer the patient, the transport route must be well planned to minimize exposure to others in transit; all HCWs involved in the transfer should wear an N95 respirator, eye protection, gown, and gloves; and the patient should wear a surgical mask.**

5. Engineering Controls

- Determine which rooms have current capacity or could be adapted (through use of portable isolation units) for isolating SARS patients for medical, pediatric, and ICU settings.
- Determine how rooms designated for SARS care will be modified to achieve appropriate airflow direction and/or air exchanges (at least 12 per hour).
- Determine how airflow/negative pressure will be verified and monitored.
- Determine the best location in the hospital and how to modify existing rooms/wards/floors to develop a “SARS Ward” where patients and dedicated staff will be cared for in relative isolation from the remainder of the health care facility. This practice may limit SARS transmission to other patients and staff, and will develop expertise among the dedicated staff.
- Develop plans for alternative measures for containment and engineering controls if the number of SARS patients exceeds the isolation capacity.

6. Hospital Access Controls

- Establish criteria and protocols for limiting hospital visitors
- Create plans and establish criteria for:
 - Fever/Symptom Screening at the emergency department (ED) and on entry
 - Limiting entry to the facility, including precluding SARS patient visits
- Determine when and how to involve security services to enforce access limitations
- Determine the threshold for when and what measures are used to actively detect possible cases (e.g., visual alerts at facility entrances, directives for symptomatic persons, priority triage of persons seeking care with respiratory symptoms, phone monitoring of appointments).

7. Communication

Each health care facility should designate a public relations specialist who should determine and document preferred information flow and release if SARS patient care or transmission occurs at the facility. Plans should be prepared for:

- Internal notification and communication
- External communication with the media and public
- Communication with the NH DHHS (1-800-852-3345)
- Development of templates for SARS frequently asked questions, notifications, press releases, etc. The NH DHHS has already prepared certain materials and will provide technical assistance on request.

8. Human Resource Needs

- Determine the number and categories of personnel who would be needed to care for a single patient or small group of patients on a given day.
- Determine how staffing needs will be met as the number of SARS patients grows and/or staff become ill.
- The NH DHHS recommends that a small cadre of staff be assigned responsibility for providing initial care for SARS patients who are admitted to the facility, including housekeeping and maintenance staff. These staff members should be well-trained in SARS infection control practices and would serve as a resource to other staff if additional patients are admitted and additional staff are needed.
- Consider whether there should be a designated “SARS Emergency Response Team” to provide resuscitation, intubation, and emergent care to possible or known SARS patients.
- Infection control personnel (ICP). The number of ICPs should be appropriate for the size of the hospital to allow daily monitoring and assessment of all patient care areas. The ICP should be appropriately trained in the concepts of infection control and including determinations of methods that are not effective that should be stopped. Additional support staff likely will be needed to assist ICP.

9. Durable and Consumable Resource Needs

The NH DHHS recommends using disposable equipment whenever possible for the care of SARS suspects/cases. Non-disposable equipment that is visibly soiled should be cleaned promptly with soap and water, detergents or enzymatic agents. Equipment should be cleaned and disinfected prior to being used with other patients. Specific to each health care facility:

- Assess the anticipated needs for personal protective equipment (PPE) and other consumable resources.
 - Verify that adequate supplies are available or can be ordered.
 - Establish back up plans in the event of limited supplies.
- Assess the availability of durable equipment and identify where additional equipment can be obtained as needed. Equipment examples include:
 - Ventilators for intubated patients
 - HEPA filtration units and other room air-circulation devices
 - Portable x-ray units

10. Technical Consultation

Consultants should be identified to provide technical assistance to planning efforts as well as for SARS care if required, including:

- Infectious Diseases/Infection Control
- Laboratory
- Mental Health
- Risk communication
- Pulmonologists/Intensivists
- Industrial Hygienists/Environmental Engineers

11. Education and Training

Education and training of health care, ancillary personnel, and patients' families should be considered.

- Determine how training will be provided for all hospital personnel that may be affected by SARS.
- Identify (or develop) training materials for environmental/housekeeping staff regarding personal protection and environmental measures for cleaning/disinfecting SARS patient care areas.
- Identify (or develop) posters and instructional materials that reinforce appropriate PPE practices including removal for HCW staff in the ED and in areas where SARS patient care is provided.
- Identify (or develop) educational materials for patients and visitors on appropriate infection control for SARS.

12. Environmental Measures

- Designate an environmental/housekeeping specialist to plan and verify that cleaning and disinfection methods and staff are appropriately prepared for providing SARS patient care at the facility.
- Verify that chosen cleaner/disinfectant is appropriate for eradicating the coronavirus.
- Develop plans to provide enhanced cleaning/disinfection of areas where SARS care is provided.
 - Frequent cleaning of environmental surfaces and noncritical patient care items using sufficient hospital grade germicide with virucide label claim is recommended.
 - Routine linen cleaning practices is sufficient, although linen should be transported from the patient's room in leak-resistant, closed laundry bags.
 - Routine practices should also be applied to handling clinical waste (double bagging is not necessary).

13. Health Care Personnel Policy

- Ensure that health care workers who may encounter SARS suspects or patients are fit tested for and instructed in the use of N95 masks and other PPE
- Exposure management: establish an exposure reporting process. Consider various mechanisms for identifying exposed personnel, e.g., self-reporting by employees, logs of personnel entering SARS patient rooms.
- Establish furlough times for unprotected exposures.
- Define acceptable employment practices during times when SARS transmission is occurring. HCWs should be required to notify the facility when they are employed or providing care at another facility that provides care to SARS patients.
- "Work Quarantine" – In the event that quarantine is used as an exposure management tool, some HCWs may need to continue working to ensure sufficient staffing levels. Appropriate measures should be developed for HCWs to comply with quarantine orders and to continue working at the health care facility. Limitations on alternative employment will be needed. (See: <http://www.cdc.gov/ncidod/sars/exposuremanagementframe.htm>)

14. Assessment of Plan Effectiveness

Identify criteria and methods for measuring compliance with infection control processes and practices (i.e., appropriate use of PPE, early detection, patient placement).

APPENDIX 4. SARS Preparedness and Case Investigation at Ambulatory Health Care Facilities

These guidelines are intended for ambulatory health care settings. The settings addressed here may have less infection control capacity than hospitals by virtue of fewer personnel, less specialized infection control equipment, and space for dedicated isolation. For many small clinician/provider offices, screening SARS suspects may substantially disrupt clinic operations, create decontamination challenges, and lead to further transmission. But these settings are potentially the “frontlines” of SARS control in NH, with unique opportunities for disease control.

It is understood that one set of guidelines will not meet the needs of all ambulatory care settings, since these are varied from large multi-specialty clinics to single practitioner offices. It is hoped that these guidelines provide useful principles and act as a foundation for clinical response to SARS and potentially for other airborne infectious diseases.

A. The SARS Contact

This person (or persons, when capacity allows) should:

- Be responsible for familiarity and compliance with these guidelines
- Serve as a coordinating point in the event that SARS suspects or patients are cared for by the facility
- Be in contact with the regional Smallpox Preparedness Group, who will be advising DHHS about regional SARS needs
- Review CDC SARS-related materials prior to the onset of the influenza season, and contact the BCDC with any questions or concerns.

B. SARS Plan Components

The SARS contact should consider the following components and NH DHHS recommendations:

1. Surveillance and Early Detection of SARS

- The SARS contact should be responsible for regularly reviewing available public health information regarding SARS activity in the country and geographic region
- The SARS contact should meet with infection control practitioners, infectious disease physician, and/or emergency department personnel from their nearest hospital to insure maximal communication during the influenza season. As a group, these individuals should clarify a patient transport strategy if the need arises for a SARS-related hospitalization.

2. Infection Control for Persons with Fever and Cough

In addition to SARS-specific infection control measures, facilities should consider instituting a campaign to have any patients with fever and cough of unknown etiology wear a mask while in settings where they encounter others such as clinic waiting rooms. The DHHS is developing a poster that will promote this message and be appropriate to attach a box of masks for immediate dispensing. This will help prevent transmission of other serious, contagious diseases such as influenza and tuberculosis.

3. Triage of SARS Suspects

NH DHHS recommends that **all health care facilities** post a sign in a highly visible area informing patients who may need to be screened for SARS to report immediately to the appropriate facility-designated triage staff. Facilities should carefully consider the physical location of this triage individual

(i.e., in the area of least possible transmission and minimal clinic traffic pattern). Some patients may not see or respond to the sign prompt, and a second-line plan to identify SARS suspects may need to occur. For example, an ambulatory care center receptionist should be prepared to question patients. Personnel in this role who are not medically trained may need a card prompt available to assist them.

The sign prompt and screening staff should ask the following screening questions:

- Have you had respiratory symptoms in the last 48 hours or a documented fever >100.4° F (38° C)?
- Have you traveled in the ten days before onset of current symptoms to an area with known SARS transmission?
- Have you been in close contact with someone who has traveled to an area with known SARS transmission and who is currently suffering a respiratory illness?

In addition, any after-hours/weekend clinic phone line should prompt patients how to proceed if they suspect they might have SARS. If SARS is identified in NH, the three questions above can be included in the clinic voice mail message. Patients can be instructed to contact the on-call clinician to determine if and where they should be further evaluated.

4 Models for the Evaluation of SARS Suspects

If the three screening questions above disclose that a patient is a suspect case of SARS, a surgical (not N-95) mask should be placed on the patient, and **contact, droplet, and airborne precautions** should be implemented immediately, if possible. Hand washing, gown, and glove procedures are those routinely prescribed for contact, airborne, and droplet precautions

(<http://www.cdc.gov/ncidod/hip/isolat/isopart1.htm>). To separate potential SARS patients from staff and other patients seeking care at the facility, the SARS suspect should be moved to an evaluation area.

The following are models for evaluation of SARS suspects. These models may be applicable in the various ambulatory care settings of NH. With input from local clinicians, the regions defined by previous smallpox preparedness activities will select the most appropriate model or (more likely) combination of models. This list is not exhaustive, and these models will require modification to a locally defined strategy for patient transport, triage, and case management. The smallpox regional planning teams can be instrumental to clarify roles and responsibilities, patient flow issues, and to facilitate communication between clinicians, the nearest hospital, and DHHS.

- **Model A: Confirm infection control capacity at providers' offices.** In this model, each health care provider demonstrates compliance with infection control guidelines outlined in Appendix 3 for non-ambulatory health care facilities. For example, a room at each facility which might encounter SARS suspects must be created (or verified to already be equipped) with negative pressure and HEPA filtration, staff should be fit tested and educated for N95 mask use, a plan for facility decontamination be in place, etc. The advantages of this model are 1) a clinician can provide prompt care for the SARS suspect rather than referring elsewhere; 2) transport of the SARS suspect is not necessary, hence reducing opportunities for further transmission during transit; and 3) local capacity to handle other airborne pathogen epidemics is increased. The disadvantages are predominately 1) the provider expense for compliance; and 2) the extended time to achieve compliance, which will be beyond the 2003-4 winter (when SARS may recur).
- **Model B: Designate a regional SARS screening site(s).** In this model, the region designates, equips, and promotes a single center (or few centers) for SARS screening. The ambulatory health care provider can then refer a SARS suspect for evaluation at this site. These sites may be existing clinics or established de novo, such as by equipping a stationary trailer adjacent to a hospital. The DHHS is in the process of purchasing portable isolation units which will be

deployed to hospitals to increase statewide isolation capacity and may be useful for this purpose. Logistics for patient transfer must be agreed upon in advance: how will patients go to the site; how will it be ensured that they go; if by ambulance, who will cover the cost of the transfer, etc. The advantages of this model are 1) centralized capacity and expertise; 2) avoiding costs (time and money) associated with establishing compliance at multiple providers' offices (model A); and 3) minimizing disruption to the referring facility. The major disadvantage is that there are logistical challenges for keeping such a site adequately staffed and equipped, particularly if no or few cases of SARS are identified.

- **Model C: Equip a regional mobile SARS screening station.** In this model, each region appropriately equips a mobile unit that can immediately respond to an ambulatory care center's request for patient screening. This mobile station would need to be available during all the hours that ambulatory care settings operate (evenings and weekends in many cases). The advantages are 1) centralized capacity and expertise; 2) avoiding costs (time and money) associated with establishing compliance at every provider office (model A); and 3) minimizing disruption to the referring facility. The major disadvantage is the cost and staffing of such a mobile station.
- **Model D: Regional (or central) infection control equipment access.** In this model, a provider verifies ahead of need that there is the space and expertise to receive, use and decontaminate mobile infection control equipment, such as a portable isolation unit. The equipment may be stored regionally or centrally. The DHHS is in the process of purchasing portable isolation units, some of which will be deployed to hospitals, and others may be held for the purpose of this model. The advantage is avoiding costs (time and money) associated with establishing permanent compliance at every provider office (model A). The disadvantage is the time and expertise required for proper functioning of the equipment in diverse settings.
- **Model E: Access a central mobile SARS screening station.** In this model, the DHHS and NH BEM equip mobile units that can be dispatched to a region in case of need. Like the regional mobile SARS screening station, this station would also need to be available during all the hours that ambulatory care settings operate. The advantages are 1) centralized capacity and expertise; 2) avoiding costs (time and money) associated with establishing regional capacity (models A-C); and 3) minimizing disruption to the referring facility. The major disadvantages are that 1) regional capacity is not developed; 2) regions will have to staff these once deployed, and therefore orientation and training for proper use will be required ahead of time; and 3) there may be delay in a centrally dispatched station arriving where needed, particularly for the more remote sites in the State. *This model should not be the sole choice for a regional response, and may not be available for immediate deployment. It is intended primarily to address surge capacity.*

Wherever SARS suspects are evaluated, evaluation staff should wear an N95 respirator. If SARS is ruled out, then the respirator may be reused. The respirators can be re-used repeatedly by the same HCW if they are properly handled, stored, and not contaminated. Respirators should be stored in a clean, dry location, and discarded if crushed, wet, or contaminated by patient secretions. If SARS has not been ruled out, then do not reuse the respirator after removal. If an N95 respirator is not immediately available and patient contact is unavoidable, a surgical mask should be worn because it may provide some protection.

Evaluating staff should also wear eye protection such as goggles or full face shields (prescription glasses are inadequate) when:

- The patient is not wearing a mask
- During any cough-producing and aerosol-generating procedures
- When there is the potential for splattering or spraying blood or other body substances.

Goggles and face shields may be reused, if cleaned in a manner that will not contaminate the HCW. They should be cleaned between uses according to the manufacturer's recommendations using low-level disinfection at a minimum.

According to the Canadian experience (www.hc-sc.gc.ca/english/protection/warnings/sars/index.html), there is no evidence to support the routine need for enhanced respiratory personal protective equipment such as the powered air-purified respirator (PAPR) system. However, during certain high-risk procedures such as a difficult endotracheal intubation, the PAPR system should be considered in balance to the potential that the increased complexity involved in the removal, disposal, and decontamination of this equipment may increase the risk of HCW self-contamination.

Any persons accompanying the patient (and subsequent visitors) should be given an N95 respirator and instructed regarding fit, or not allowed to accompany the patient.

5. Interfacility Communication

Evaluating staff should inform DHHS (1-800-852-3345), and the local hospital infection control department that an ambulatory patient is under investigation for SARS, and consult with an infectious diseases specialist. Currently, DHHS is also recommending that:

- **Patients with SARS not be transferred to other health care facilities unless absolutely medically necessary.** This clinical determination should be reached by consensus among the ambulatory health care facility, the infectious disease consultant, and the emergency department attending physician at the receiving hospital.
- **It is not recommended that patients with SARS be transferred solely for the purpose of accommodation in a negative pressure room.**
- **If it is deemed necessary to transfer the patient, the transport route must be well-planned to minimize exposure to others in transit; all HCWs involved in the transfer should wear an N95 respirator, eye protection, gown, and gloves; and the patient should wear a surgical mask.**

If the decision is made that the patient needs to be hospitalized, appropriate paths for movement of SARS patients within a facility and how they will be controlled to limit contact must be known prior to transport. This movement must be minimized to absolutely essential procedures. Personnel in the area to which the patient is to be transported should be essential only, have received prior notification, and be made aware of appropriate precautions. Only essential personnel and the patient should ride in the transport vehicle.

6. Durable and Consumable Resource Needs

The NH DHHS recommends using disposable equipment whenever possible for the care of SARS suspects/cases. Non-disposable equipment that is visibly soiled should be cleaned promptly with soap and water, detergents, or enzymatic agents. Equipment should be cleaned and disinfected prior to being used with other patients. Specific to each health care facility:

- Assess the anticipated needs for personal protective equipment (PPE) and other consumable resources.
 - Verify that adequate supplies are available or can be ordered. Although such estimates can be challenging, a starting point may be to have at least enough supplies to evaluate 10 SARS suspects. It should be anticipated that in the event of a recurrence of SARS in the U.S., there may be a shortage of PPE supplies.
 - Establish back-up plans in the event of limited supplies. DHHS will maintain a limited emergency supply of PPE.

- Assess the availability of durable equipment and identify where additional equipment can be obtained as needed. Equipment examples include:
 - Pulse oximeters to measure blood oxygen
 - Ventilators for intubated patients
 - HEPA filtration units and other room air-circulation devices
 - Portable x-ray units

7. Education and Training

Education and training of health care, ancillary personnel, and patients' families should be considered.

- Determine how training will be provided for all ambulatory care center personnel who may be affected by SARS.
- Identify (or develop) training materials for environmental/housekeeping staff regarding personal protection and environmental measures for cleaning/disinfecting SARS patient care areas.
- Identify (or develop) posters and instructional materials that reinforce appropriate PPE practices including removal.
- Identify (or develop) educational materials for patients and visitors on appropriate infection control for SARS.

8. Environmental Measures

- Develop plans to provide enhanced cleaning/disinfection of areas where SARS evaluation is provided.
 - Frequent cleaning of environmental surfaces and non-critical patient care items using sufficient hospital-grade germicide with virucide label claim is recommended.
 - Routine linen cleaning practices is sufficient, although linen should be transported from the patient's room in leak-resistant, closed laundry bags.
 - Routine practices should also be applied to handling clinical waste (double bagging is not necessary).

9. Health Care Personnel Policy

- Ensure that health care workers who may come in contact with SARS suspects or patients are fit tested for and instructed in use of N95 masks and other PPE.
- Exposure management: establish an exposure reporting process.
- Establish furlough times for unprotected exposures.
- Define acceptable employment practices during times when SARS transmission is occurring. HCWs should be required to notify the facility when they are employed or providing care at another facility that provides care to SARS patients.
- "Work Quarantine" – In the event that quarantine is used as an exposure management tool, some HCWs may need to continue working to ensure sufficient staffing levels. Appropriate measures should be developed for HCWs to comply with quarantine orders and to continue working at the health care facility. Limitations on alternative employment will be needed. (See: <http://www.cdc.gov/ncidod/sars/exposuremanagementframe.htm>).

APPENDIX 5. Isolation and Quarantine Procedures for SARS

A. Relevant Definitions

Isolation*: Restriction of movement or activities or separation of a person sick with SARS.

- For SARS, **most sick persons can be restricted to their homes**, if the appropriate mechanisms for clinician consultation and evaluation are ensured. Isolation of SARS patients may also be at a dedicated isolation facility. When the sick person requires more advanced medical support, isolation may be in a health care facility.
- SARS patients should be isolated until they are no longer infectious. This is currently defined as 10 days after the resolution of fever, provided respiratory symptoms are absent or improving.
- Typically applied on individual level.

Active monitoring*: Close observation of well person(s) exposed to SARS, for signs and symptoms of disease; usually applied to contacts of sick SARS patient.

- **Usually at persons' home**, but can be in dedicated facility or hospital
- Can be passive or active
- Individual or population-specific

Quarantine*: Restriction of movement and activities or separation of well person(s) believed exposed to SARS.

- **Usually at home**, but can be in a dedicated facility or hospital; the term quarantine can also be applied to restriction of movement into or out of buildings, other structures, and large conveyances.
- **Types of quarantine:**
 - Individual quarantine
 - Population-specific quarantine: Restriction of movement/activities of a specific group of persons which is not defined by a geographic area, but may be defined by group membership or congregate setting attendance/exposure.
 - Geographic quarantine: Restriction of movement/activities of persons within a defined geographic area. Examples of geographic areas include neighborhoods, townships, cities, counties, and states.

Containment Measures*: When surveillance, isolation, active monitoring, and quarantine are used together, these are called containment measures. Types of containment measures:

- Individual containment measures: When these tools are applied to an individual
- Community containment measures: When these tools are applied to a group of persons in a specific geographic area or involved in specific activity. Community containment measures can be applied to a cluster/group of contacts or a specific population exposed to one or more [suspect or probable] cases in a defined group gathering or congregate setting.

***Voluntary versus mandatory/compulsory containment measures:** Containment measures are usually voluntary, but can be mandatory/compulsory; the NH Health Commissioner has legal quarantine authority which covers mandatory/compulsory isolation, surveillance and quarantine.

B. Principles of Containment Measures

Most isolation, quarantine, and clinical management for SARS can be managed at the patient's home. SARS patients receiving care at home must wear a surgical mask and avoid contact with other people. **Patients should not be hospitalized solely for the purpose of infection control** unless they cannot be discharged directly to their home (e.g., travelers, homeless persons) or if the infection precautions recommended for the home are not feasible (e.g., crowded dormitory setting, prisons, jails, detention centers, homeless shelters, or other multi-person single room dwellings). Under such circumstances, patient may be hospitalized using recommended infection control precautions, or may be discharged to a designated residential facility for isolation of convalescing cases where recommended infection control measures can be followed. The NH DHHS will establish such a facility if the need arises, and this will serve as a statewide resource.

Patients seen in ambulatory settings should not be routinely referred to a hospital for evaluation of SARS, to avoid incurring transmission to hospital patients and staff, or contaminating the facility.

Patients who are more severely ill may require hospitalization. In addition to standard infection control measures (e.g., hand washing), infection control measures for all suspect or confirmed SARS in-patients should include:

- **Airborne precautions** such as an isolation room with negative pressure relative to the surrounding area and use of an N95 respirator (mask) for persons entering the room; *and*
- **Droplet and contact precautions** (use of gown, gloves, and eye protection for contact with patient or their environment). All current evidence indicates that infection control measures are effective in preventing transmission to care givers.

The U.S. Secretary of Health and Human Services has statutory responsibility for preventing the introduction, transmission, and spread of communicable diseases from foreign countries into the United States, i.e., at international ports of arrival and from one state or into another. The CDC, through its Division of Global Migration and Quarantine, also is empowered to detain, medically examine, or conditionally release individuals suspected of carrying certain communicable diseases. A new executive order of the President was recently issued adding SARS to the list of detainable communicable diseases. For reference to and explanation of this order, see <http://www.cdc.gov/ncidod/SARS/quarantineqa.htm>.

States generally have the authority to declare and enforce quarantine within their borders. This authority varies widely from state to state, depending on the laws of each state. This authority derives from section 361 of the Public Health Service Act (42 U.S.C. 264). In NH, RSA 1478 gives the Health Commissioner the authority to mandate involuntary quarantine and isolation. Contact DHHS regarding this mandate.

C. Recommendations for Persons Providing Care to Persons in Isolation in the Home Setting (Adapted from the document developed by Capital Health, Edmonton, Alberta)

The person who is sick should stay isolated at home until DHHS advises that this is no longer necessary. While at home, the person(s) providing care should insure the following:

- Household members should notify DHHS and their health care provider immediately if they themselves start to feel unwell and develop a cough or fever or any other respiratory symptoms.
- *Isolate the sick person:*
If possible, only the person who is taking care of the sick person should stay with them. The sick person should stay in one room with the door closed and with the window open, if possible.
Other members of the family should stay away from the sick person and not handle or share

things such as dishes, books, toys, or anything that the sick person has used unless it has been washed thoroughly with soap and water or regular household cleaning product by the designated care provider. The sick person should use a separate bathroom and separate towels from the rest of the family. To protect them from getting the illness, parents should arrange for children in the household to stay with someone else while there is a sick person in the home. Discourage any visits from people who do not live in the house. If visitors come to the house, meet them outside and do not let them into the house.

- *Wear masks:*
The person caring for the sick person should wear a mask because we know that SARS is spread by close contact. The sick person should always wear a mask if they leave their room or if another person is in the room with them, and anyone going in to the room should put on a mask before entering. The person caring for the sick person will be given a supply of masks and instructed on how to use them.
- *Hand washing is important:*
Individuals who are ill, caring for someone who is ill, or residing in the same household as an ill person, should wash their hands often using soap and warm water. The person who is ill should cover his/her mouth when coughing or sneezing and wash his/her hands immediately after. Hands should be washed immediately after providing care to the sick person. Waterless hand wash agents can also be used.
- *Keep things clean:*
The sick person's bed sheets, towels and clothes can be washed with items from other household members, preferably in warm water. A washing machine may be used, however, the sick person's laundry should not be left sitting outside of their room, for example in a laundry room where other household members may be in contact with it. Used tissues should be put by the ill person directly into a garbage bag, which can be sealed in the sick person's room and taken directly outside by the care provider for collection with the regular garbage. Surfaces and items inside the sick person's room should be cleaned with regular household cleansers. Items handled by the sick person, including cutlery and glasses, should be cleaned by the care provider (or in a dishwasher) immediately upon removal from the sick person's room.
- *Care in the home:*
The sick person should follow the usual guidelines for taking care of themselves when ill: REST, drink plenty of fluids, and take acetaminophen or ibuprofen for fever and pain. Taking cough medicine, decongestants, and/or sore throat lozenges may be helpful to relieve symptoms. The sick person's temperature should be taken at least twice a day with a thermometer and recorded. If the sick person is taking acetaminophen (e.g., Tylenol) or ibuprofen (e.g., Advil), the temperature should be recorded at least 4 hours after the last dose of these fever-reducing medicines.
- *When to call for help:*
Public health will call at least once every day to check on the sick person's condition. If the symptoms worsen, including increased shortness of breath or the person shows other signs of concern for example, extreme drowsiness or has not urinated for 12 hours, you should call your public health authority or your health care provider for instructions (1-800 852-3345). It is an EMERGENCY if the person shows any of these signs:
 - Trouble breathing
 - Blue lips

- Limpness or inability to move
- Hard to wake or unresponsive
- Stiff neck, seems confused, or has a seizure.

CALL 911 IMMEDIATELY, NOTIFYING THEM THE PERSON HAS BEEN DIAGNOSED WITH SUSPECT SARS.

APPENDIX 6. Management of Airline Passengers with Suspect Disease of Major Public Health Concern

Intent: These recommendations are designed to assist airline and airport staff in the event that a specific communicable disease concern has been recognized globally and heightened disease surveillance is already underway. These procedures would apply for contagious diseases of major public health concern.

1. Emergency Procedures: This policy shall be implemented when a suspect disease is identified in a passenger or crewmember en route to Manchester Airport.
2. When the flight crew identifies a passenger or crew member with symptoms suggestive of one of the diseases of concern, standard procedures for notification of the Manchester Airport of an ill person on board will be followed by the aircraft's captain.
3. If the ill person is coughing, a surgical mask should be provided if available and the passenger should be required to wear it for the remainder of the flight. Any ill person covered by this policy should be removed to an area of the aircraft away from other passengers if possible. A mask should also be worn by the crewmember caring for the individual.
4. If the ill person is bleeding, care should be taken to prevent contact with blood and/or other body secretions among other passengers and crew. If available, disposable rubber gloves, eye protection, and a mask should be worn by any individual providing care to such an ill person.
5. All crew and passengers having contact with the ill person should carefully wash their hands with soap and water.
6. Upon notification by the aircraft captain of an impending arrival of a passenger/crewmember with suspicion of one of the diseases of concern, the Manchester Airport Director or designee shall immediately notify the Manchester Health Department (MHD) at 603-624-6466 during normal business hours. During nights, weekends, and holidays, Manchester Health Department Staff can be contacted by cell phone or pager (see attached list) or call the State of NH Department of Health and Human Services (DHHS) Emergency Number at 603-271-5300. The MHD will notify the NH DHHS of the developing situation as soon as possible.
7. The Manchester Health Department and/or the State Public Health Authority will arrange for properly equipped and trained medical personnel to be on hand at the Airport to secure and transport the patient to an appropriate medical facility. The MHD or DHHS will provide appropriate notification and instructions to the designated receiving medical facility's ICP and hospital epidemiologist.
8. The aircraft may be directed to park at a remote area of the airport or at a vacant hanger at the discretion of public health and airport officials.
9. Upon arrival, the appropriate public health and medical team will escort the passenger directly to the designated medical facility before any other passengers or crew disembark.
10. All family members and persons accompanying the ill person will also be escorted to the designated medical facility.

11. Once the ill passenger and accompanying persons have been assisted from the aircraft, public health officials will enter the aircraft and make an announcement to reassure passengers and provide appropriate information regarding the potential disease, means of transmission, symptoms etc.
12. After the above announcement is made the public health official will distribute two documents to all crew and passengers prior to their disembarking.
 - A form requesting identifying information for purposes of follow-up if the ill person is confirmed to have a case of one of the above diseases. The information includes name, address, final destination, and telephone numbers where the person can be reached over the next ten days. All passengers and crew must fill out the form before disembarking and surrender the form to the public health official.
 - Health Information Advisory for all crew and passengers with essential information on how to proceed if they become ill and the symptoms to be alert to.
13. The public health official will obtain locating information on all passengers and crew for preventive public health measures depending on the final diagnosis of the ill passenger. Depending on the potential disease involved, passengers and crew may be detained as necessary to prevent introduction of disease into the community. The MHD in cooperation with the DHHS will coordinate any such disease control activities with the CDC.
14. All passengers and crew may then disembark unless otherwise detained due to the potential disease concern.
15. The plane will be cleaned and disinfected with an Environmental Protection Agency-approved disinfectant.
16. Manchester Airport administration and security officials will assist the MHD by assuring that the above procedures are enforced.

APPENDIX 7. Preliminary SARS Response Plan

1. SARS Alert Levels Defined

For the purpose of SARS investigation and response, the following alert levels are designated.

Alert Level 0 – No NH cases of SARS

Alert Level 1 – A single suspect case reported within NH

Alert Level 2 – Single or multiple probable or confirmed case(s) reported in NH with an identified pattern of transmission

Alert Level 3 – Multiple cases reported within NH borders without an identified pattern of transmission

2. SARS Alert Level Responses

2.1. Alert Level 0 Activities

- 2.1.1. DHHS Surveillance Team members will conduct routine syndromic surveillance for SARS illness in NH hospitals
- 2.1.2. All Team members will conduct education and training sessions for appropriate health care providers and emergency response officials including Hazmat, police, fire, EMT, and hospital officials.
- 2.1.3. DHHS will provide information to hospitals regarding appropriate screening triage procedures, infection control and notification procedures for persons with suspect SARS illness.
- 2.1.4. DHHS in cooperation with the NH Department of Transportation and NH Department of Safety, Bureau of Emergency Management will implement federal travel recommendations.

2.2. Alert Level 1 Activities

- 2.2.1. All activities under Alert Level 0 will be instituted.
- 2.2.2. The State Epidemiologist will convene the NH DHHS Outbreak Team at the earliest opportunity.
- 2.2.3. The Contact/Patient Investigation Team (C/PIT) members will work with the reporting physician(s) to confirm the diagnosis and classify the case according to CDC Case Definitions for SARS and Response Guidelines. **The Contact/Patient Investigation Team can be initiated by calling 603-271-4496 during business hours, or 603-271-5300 after hours.**
- 2.2.4. The C/PIT will work with the physician to obtain necessary clinical specimens. The PHL will coordinate “rule out” testing and/or shipment of specimens to the appropriate laboratory at CDC and dissemination of test results to appropriate parties. **The Public Health Laboratories can be reached by calling 603-271-4660 during business hours, or 603-271-5300 after hours.**
- 2.2.5. The State Epidemiologist will confirm infection control recommendations with the treating physician and hospital.
- 2.2.6. The Media Response Team members will staff a regular media availability time, if necessary.

- 2.2.7. The Director of Public Health will alert the Commissioner of the Department of Health and Human Services, and as necessary, the Director of the Office of Emergency Management, the Governor's Office, and other appropriate state agency, government officials, and community partners as required.
- 2.2.8. As appropriate, the State Epidemiologist will consult with CDC officials to obtain technical assistance in case classification and patient investigation.
- 2.2.9. In the event that the suspect case is determined to meet probable or confirmed CDC case classification according to CDC criteria, the Director of OCPH will declare an Alert Level 2.
- 2.2.10. The Surveillance Team will provide an alert to all syndromic surveillance team members and increase syndromic surveillance at all NH hospital emergency departments.
- 2.2.11. The Surveillance Team Lead will disseminate, through the Health Alert Network, additional SARS illness surveillance recommendations to all NH Hospitals, health care providers and appropriate sub-specialist (i.e., dermatologists, infectious disease specialists) as necessary.
- 2.2.12. The Contact/Patient Investigation Lead(s) will disseminate, through the Health Alert Network, updated diagnostic, isolation and treatment recommendations to all NH hospitals, state health care providers, and emergency management officials.
- 2.2.13. The Contact/Patient Investigation Lead(s) will disseminate, through the Health Alert Network, updates on the status of the reported case to all NH hospitals and state health care providers.
- 2.2.14. The Director of the PHL will disseminate, through the Health Alert Network, updates on clinical laboratory specimen collection and handling to all NH clinical laboratories.
- 2.2.15. The State Epidemiologist will convene the DHHS Outbreak Team.
- 2.2.16. NH DHHS in cooperation with the NH Department of Transportation and NH Department of Safety, Bureau of Emergency Management will implement federal travel recommendations.
- 2.3. Alert Level 2 Activities
 - 2.3.1. All activities in Alert Level 1 will be instituted.
 - 2.3.2. The Director of OCPH will notify CDC. **CDC Emergency Response can be reached 24 hours per day, 7 days per week at 770-488-7100.**
 - 2.3.3. The Director of Public Health will notify the Commissioner of the Department of Health and Human Services, the Director of the Bureau of Emergency Management, the Governor's Office, and other appropriate state agency and government officials as required.
 - 2.3.4. The Surveillance Team Lead(s) will initiate surveillance, epidemiologic investigation and contact tracing consistent with the CDC guidelines.
 - 2.3.5. The C/PIT Team Lead(s) will initiate patient management consistent with the CDC Interim SARS guidelines. All individuals who are identified as a suspect, probable or confirmed case of SARS will be managed consistent with NH RSA

141-C and CDC Interim SARS Isolation Guidelines. The NH Department of Safety will work cooperatively with the NH DHHS to assure appropriate enforcement of Orders of Quarantine, if necessary.

- 2.3.6. The C/PIT Team Lead(s) will initiate contact investigation consistent with the CDC Interim SARS Guidelines. All individuals deemed to have close contact with a known SARS case will be quarantined consistent with NH RSA 141-C and CDC Interim SARS Isolation Guidelines. The NH Department of Safety will work cooperatively with the NH DHHS to assure appropriate enforcement of Orders of Quarantine, if necessary.
- 2.3.7. NH DHHS in cooperation with the NH Department of Transportation and NH Department of Safety, Bureau of Emergency Management will implement federal travel recommendations.
- 2.3.8. The Commissioner of the Department of Health and Human Services will designate a facility in NH for quarantine of persons unable to comply with home quarantine.
- 2.4. Alert Level 3 Activities
 - 2.4.1. All activities in Alert Level 2 will be initiated.
 - 2.4.2. The Director of the BEM will initiate the NH Emergency Operations Plan.
 - 2.4.3. The Commissioner of the DHHS will designate a facility in NH for the isolation of persons unable to comply with hospital or home isolation.
 - 2.4.4. The NH Department of Safety, the Bureau of Emergency Management will implement federal travel recommendations and determine whether additional travel alerts are needed for NH.

APPENDIX 8. Phone List

Responsible Party	Telephone number
Berlin Health Department	603 752-1272
DHHS Bureau of Communicable Disease Control	603 271-4496 800 852-3345
DHHS Bureau of Communicable Disease Surveillance	603 271-0279
DHHS Director, Office of Community & Public Health	603 271-4501
DHHS Health Officer Liaison	603 271-4781
DHHS Public Health Laboratories	603 271-4661
DHHS Public Information Office	603 271-4822
DHHS State Epidemiologist	603 271-4477 or 271-4476
DHHS State Medical Director	603 271-8560
Manchester Health Department	603 624-6466
Nashua Health Department	603 589-4500
NH Bureau of Emergency Management	603 271-2231 or 800 852-3792